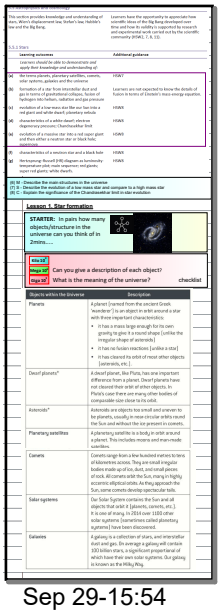
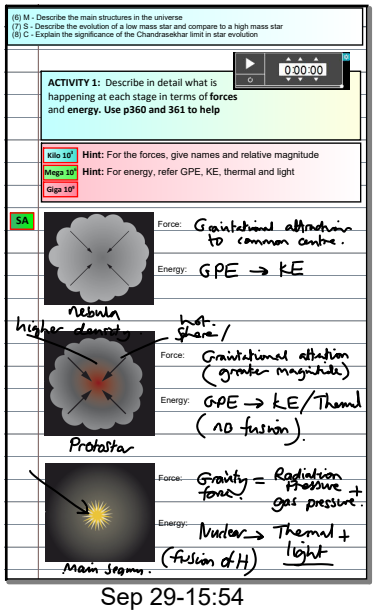
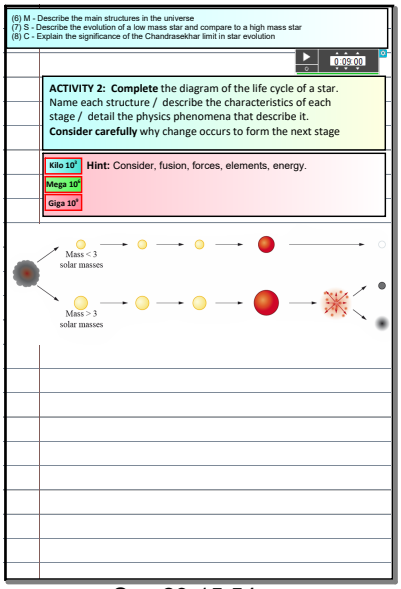


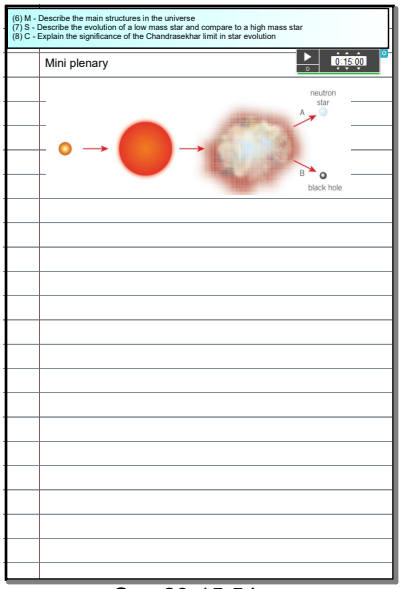
Sep 29-15:54



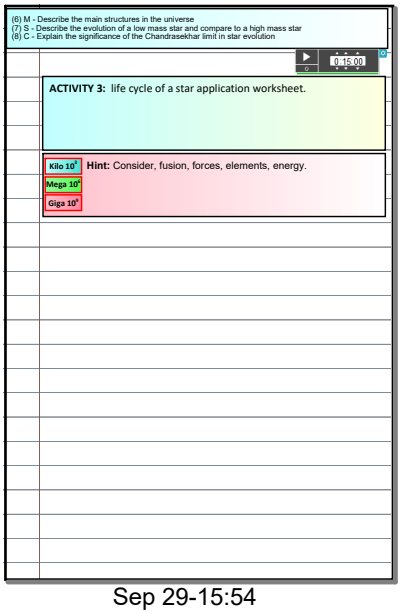
Sep 29-15:54



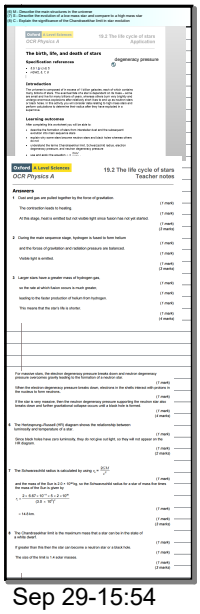
Sep 29-15:54



Sep 29-15:54



Sep 29-15:54



Sep 29-15:54

(6) M - Describe the main structures in the universe
(7) S - Describe the evolution of a low mass star and compare to a high mass star
(8) C - Explain the significance of the Chandrasekhar limit in star evolution

a Describe the formation of a star such as our Sun and its most probable evolution. In your answer you should make clear how the steps in the process are sequenced. *(6 marks)*

Extension: Contrast with a high mass star by stating the main differences.

Six from:

Matter/gases/dust attracted by gravitational forces

GPE converted to gain in KE (rise in temperature)

Temperature high enough for hydrogen to begin fusion process

Hydrogen/fuel runs out so core of Sun begins to collapse

Hydrogen fusion continues in the outer layers of Sun

Sun expands to form red giant

Outer layers drift away/form planetary nebula

Core forms a white dwarf/slowly cools and becomes dimmer

ALLOW alternative wording

Maximum five out of six if the sequence of events is incorrect

Sep 29-15:54

(6) M - Describe the main structures in the universe
(7) S - Describe the evolution of a low mass star and compare to a high mass star
(8) C - Explain the significance of the Chandrasekhar limit in star evolution

2 Antares is a red supergiant star in the constellation Scorpius.

b The future evolution of Antares will be very different from that of our own Sun.
Describe how you would expect Antares to evolve.

..... (*4 marks*)

Four from:

Temperature rises as super giant's core collapses

Helium fusion/burning starts in core

Supernova explosion occurs

If mass of core is greater than Chandrasekhar limit a neutron star is formed

If mass of core is greater than ~3 time mass of Sun a black hole is formed

Other relevant points, for example, formation of heavier elements, fusion of elements up to iron, reference to Schwarz child radius

Sep 29-15:54